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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,075	10/31/2000	Jose J. Garcia-Luna-Aceves	NC30315	1257

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Lester J Vincent
Blakely Sokoloff Taylor & Zafman LLP
Seventh Floor
124000 Wilshire Blvd.
Los Angeles, CA 90025

EXAMINER

PHILPOTT, JUSTIN M

ART UNIT	PAPER NUMBER
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2665

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/703,075

Applicant(s)

GARCIA-LUNA-ACEVES ET AL.

Examiner

Justin M Philpott

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11,17 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 30, 2003 has been entered.

Response to Amendment

2. In the Amendment filed June 30, 2003, Applicant has amended independent claims 1, 12 and 18 to include further limitations and argues that the amendments overcome the previous objection and rejections of claims under 35 U.S.C. 103(a). Applicant has also concurrently filed an additional information disclosure statement which includes newly cited documents as well as publication dates for previously cited references 49 (B57), 52 (B58) and 54 (B59) which were initially included in the information disclosure statement filed January 16, 2003. However, reference 45 is still lacking a publication date. In view of Applicant's amendments to the claims, claim 1 is no longer objected to. However, in view of the Amendment, claims 1, 12 and 18 are presently rejected under 35 U.S.C. 112, first paragraph, and claims 1-23 are rejected under 35 U.S.C. 103(a) in view of previously cited art.

Information Disclosure Statement

3. The information disclosure statement filed January 16, 2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because a date of publication is not provided for reference 45 (see 37 CFR 1.98(b)(5)). The information disclosure has been placed in the application file, but the reference 45 has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 12 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, the new limitation, "wherein a first collocated node includes two or more discrete nodes sharing a transmitter to communicate with one or more of the non-collocated

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nodes" is not clearly taught in the instant application. While Applicant's Figure 1 indicates, e.g., a first collocated node (e.g., 100) communicating with one or more of the non-collocated nodes (e.g., 160, 130) via a transmitter (e.g., B), neither the figures nor the specification appear to teach a first collocated node includes two or more discrete nodes sharing a transmitter to communicate with one or more of the non-collocated nodes. Applicant may overcome this rejection by responding with reference(s) to a passage in the originally filed specification, or to elements in the originally filed figures, which clearly teach the above-mentioned limitation.

Response to Arguments

6. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1, 2, 6-13, 17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,394,436 to Meier et al. (Meier '436) in view of U.S. Patent No. 5,682,382 to Shepard, further in view of U.S. Patent No. 5,748,619 to Meier (Meier '619).

Regarding claims 1 and 12, Meier '436 teaches an RF communications system comprising a plurality of non-collocated nodes (e.g., see FIG. 1, bridges 40 and 50), each capable of receiving and transmitting transmissions on a first interface (e.g., RF links 106 and 114), and a plurality of collocated nodes (e.g., bridges 24 and 42), each capable of communicating between

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one another over a second interface (e.g., data communication link 16). Furthermore, each of the plurality of collocated nodes is capable of receiving and transmitting transmissions to and from the plurality of non-collocated nodes on the first interface (e.g., via RF links 104 and 110).

Collocated nodes exchange scheduling information with one another over the second interface (e.g., see col. 3, line 4 – col. 4, line 19), wherein the scheduling information is associated with transmissions between the plurality of collocated nodes and each of the non-collocated nodes on the first interface (e.g., RF links 106 and 114). The scheduling information determines a schedule (spanning tree, see col. 3, lines 49-55) for the plurality of collocated nodes (e.g., bridges 24 and 42) for transmission between the plurality of collocated nodes and each of the plurality of non-collocated nodes (e.g., bridges 40 and 50) on the first interface.

However, Meier '436 may not specifically disclose the schedule information (e.g., spanning tree) includes information on when and in what order the transmissions may occur in the network.

Shepard, like Meier '436, teaches a method involving packet radio network communications systems. Shepard, however, further teaches decentralized channel management for providing collision-free packet transfer (e.g., see col. 2, line 21 – col. 3, line 20). Shepard discloses that it is known in the art of packet radio network communications systems that such systems are prone to interference and often require retransmissions due to overlapping transmit and receive windows and thus, waste power for completing such retransmissions (e.g., see col. 1, line 15 – col. 2, line 18). To solve this problem, Shepard introduces a method of decentralized channel management for providing collision-free packet transfer wherein the nodes (e.g., stations) exchange scheduling information (e.g., schedules) which includes information on when

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and in what order the transmissions may occur in the network (e.g., see col. 9, line 58 – col. 10, line 4 regarding scheduling a time for transmission with respect to transmit and receive windows). By exchanging scheduling information which includes information on when and in what order the transmissions may occur in the network, Shepard provides collision-free packet transfer wherein interference of neighboring stations is avoided and accordingly energy typically used for retransmissions is conserved. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to include the scheduling information of Shepard with that of Meier '436 in order to provide a packet radio network communications network having collision-free packet transfer wherein interference of neighboring stations is avoided and accordingly energy typically used for retransmissions is conserved.

However, Meier '436 in view of Shepard may not specifically disclose a first collocated node includes two or more discrete nodes sharing a transmitter to communicate with one or more of the non-collocated nodes.

Meier '619 teaches methods for wireless LANS similar to Meier '436, however, Meier '619 further teaches a first collocated node (e.g., subnet 401 in FIG. 8) includes a plurality of discrete nodes (e.g., host 407 and PC 409) sharing a transmitter (e.g., 425) to communicate with one or more of the non-collocated nodes (e.g., 431 and 433). The teachings of Meier '619 provide for routing data through a wired and wireless communications network efficiently, dynamically, without looping, and with minimal impact upon experiencing lost network nodes (e.g., see col. 2, lines 57-67). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Meier '619 to the method of Meier '436 in view of Shepard in order to route data through a wired and wireless communications network

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efficiently, dynamically, without looping, and with minimal impact upon experiencing lost network nodes.

Regarding claims 2 and 13, Meier '436 teaches a preferred embodiment wherein collocated nodes exchange scheduling information (e.g., HELLO packet) over the first interface during a time frame (e.g., two seconds, see col. 20, lines 7-8) such that data is also sent by the non-collocated nodes over the second interface during the time frame (e.g., see col. 20, lines 2-5 regarding five millisecond data packet segments).

Regarding claim 6, Meier '436 teaches sending a schedule packet (which is part of the information comprised within HELLO packet, see col. 12, line 61 – col. 13, line 27) from a first at least one of a plurality of collocated nodes (e.g., bridges) to a second at least one collocated node of the plurality of collocated nodes over a first interface (e.g., RF links) as well as sending, in response to receiving the schedule packet, an acknowledgement packet (e.g., ATTACH.request, see col. 4, lines 29-31) from the second to the first collocated node(s).

Regarding claim 7, Meier '436 teaches the further steps of: setting a sequence number (e.g., count of nodes or number of hops, see col. 4, lines 9-19) to the value of the sequence number of the schedule packet (e.g., part of HELLO packet) received; sending a hello packet (e.g., part of HELLO packet) which identifies the sending collocated node(s) (e.g., address of the sender, see col. 4, line 9) and a sequence number (e.g., count of nodes or hops, see col. 4, line 11) of a last sent schedule packet from the first collocated node(s); determining if the sequence number of the last sent schedule packet is less than the sequence number of a last received schedule packet (e.g., see col. 4, lines 54-67); and in response to a positive determination: transmitting a hello response to the previous sending collocated node(s) which includes the

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sequence number for the last received schedule packet. This last step of determining and transmitting is taught by Meier '436 in col. 4, lines 54-61 in combination with col. 4, lines 27-39, wherein a block 215 at the receiving node (e.g., bridge) determines whether the sequence number (e.g., count of nodes or hops, distance to the root node) provided by the received schedule packet (e.g., HELLO packet) is less than the sequence number (e.g. distance to the root node) provided by the previous schedule packet (e.g., HELLO packet). If positive determination is made, a hello response (e.g., ATTACH.request) is transmitted to the previous sending collocated node(s). Thus, the receiving collocated node(s) maintains position according to the smallest sequence number, i.e., maintains attachment to the spanning tree at the node that is logically closest to the root node (e.g., see col. 4, lines 59-61).

Regarding claim 8, Meier '436 teaches another embodiment (e.g., see col. 5, lines 6-10) similar to that described above, but which further comprises sending a second hello packet (e.g., ATTACH.response) from the first collocated node(s) in response to resetting the sequence number (e.g., count of nodes or hops) to the larger of the last sent schedule packet (e.g., previous count of nodes or hops) or 1 plus the last received schedule packet (e.g., current possible count of nodes or hops) which was received in hello response (e.g., HELLO).

Regarding claim 9, the teachings of Meier '436 as discussed above regarding claim 7 apply here, wherein if a negative determination is made from the determining step of claim 7, the receiving collocated node(s) still maintain position according to the smallest sequence number, i.e., maintains attachment to the spanning tree at the node that is logically closest to the root node (e.g., see col. 4, lines 59-61).

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Regarding claims 10, 11 and 17, Meier '436 teaches a first interface comprising a wired link (e.g., hard-wired communication link, see col. 3, lines 12-13) and a second interface comprising a wireless link (e.g., RF links, see col. 3, line 15). Further, regarding claim 11, Meier '436 discloses RF transmission (e.g., see col. 3, lines 4-19) and Examiner takes official notice that it is well known in the art to utilize orthogonal channels to provide suitable RF transmission.

Regarding claim 23, as discussed above regarding claims 1 and 12, the schedule of Shepard is a conflict-free transmission schedule (e.g., see col. 2, line 21 – col. 3, line 20; and col. 9, line 58 – col. 10, line 4).

9. Claims 3-5 and 14-16 are rejected under 103(a) as being unpatentable over Meier '436 in view of Shepard, further in view of Meier '619, further in view of U.S. Patent No. 6,363,062 to Aaronson et al.

Regarding claims 3, 4, 14 and 15, Meier '436 in view of Shepard in view of Meier '619 teaches the method of claims 1, 2, 12 and 13 as discussed above, however, may not specifically disclose having a first and second time frame for particular transmissions or exchanging second control information over the second interface.

Aaronson teaches a communications protocol for wireless communications whereby time is broken up into frames, further divided into slots (e.g., see col. 4, lines 22-44). A control channel, comprising slots used for control information, as well as a data channel, comprising the remaining slots, are provided within each frame. Thus, Aaronson teaches improved means of wireless communications having a first and second time frame in the form of a control channel and a data channel, or control and data portions. Specifically, the teachings of Aaronson provide

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dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information (e.g., see col. 3, line 47 – col. 4, line 2). Aaronson also teaches wireless communications links such as those found in the second interface of Meier `436 (e.g., RF links) whereby both control information and data are transmitted. Thus, the teachings of Meier `436 in view of Shepard in view of Meier `619 would clearly benefit from implementing the communications protocol of Aaronson. Such a combination would provide more reliable transmission between non-located and located nodes whereby both control information and data could be transmitted between nodes. Furthermore, as discussed above, the teachings of Aaronson provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to use the communications protocol of Aaronson with the system of Meier `436 in view of Shepard in view of Meier `619 in order to, e.g., provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information.

Regarding claims 5 and 16, as already discussed above regarding claims 1 and 12, Meier `436 teaches a system comprising located and non-located nodes with first and second interfaces whereby scheduling information is exchanged. A schedule packet (e.g., HELLO packet) is sent from one or more located node(s) to each other located node which includes: an indication of all known nodes (e.g., combination of the spanning tree and the detached-node list, see col. 13, line 20-22), including those within a 2-hop neighborhood of each previous node, and incoming and outgoing collision-free links of the node(s) that are already

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scheduled (e.g., spanning tree). Meier '436 also includes nodes constantly listening while not in active scheduled links (e.g., see col. 7, lines 35-39).

Meier '436 in view of Shepard in view of Meier '619, however, may not specifically include time slots and data channels in which new links can be reserved and on which nodes will be listening.

Aaronson teaches time slots and data channels (e.g., see col. 4, lines 22-62) in which new links can be reserved (e.g., lines 34-36) and on which nodes will be listening (e.g., to requests and grants on control channel, see col. 4, lines 51-55). Applying the scheduling method of Aaronson to the system of Meier '436 in view of Shepard in view of Meier '619 would provide an improved means for scheduling within a hard-wired and wireless communications network. Also, as discussed above, the teachings of Aaronson provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information (e.g., see col. 3, line 47 – col. 4, line 2). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to use the communications protocol of Aaronson with the system of Meier '436 in view of Shepard in view of Meier '619 in order to, e.g., provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information.

10. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier '436 in view of Shepard in view of Meier '619, further in view of U.S. Patent No. 5,673,031 to Meier (hereinafter referred to as Meier '031).

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Regarding claim 18, Meier '436 in view of Shepard in view of Meier '619 teaches an apparatus as described above regarding claim 1, however, may not specifically disclose using routers.

Meier '031 teaches a further advancement for a packet radio network communications system such as the system taught by Meier '436. Meier '031 teaches a redundant RF network having a roaming terminal communication protocol to provide communications to remote terminals at greater distances without increasing base station range which would increase power consumption and increase collisions (e.g., see col. 2, lines 16-23 and col. 3, lines 1-29). Meier '031 further teaches advantageously implementing routers as communication nodes (e.g., see col. 30, line 54 – col. 32, line 23) to provide guaranteed coverage for fringe areas without adding additional wiring and to provide continuing coverage when a wired base fails. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement routers as taught by Meier '031 for the communicating entities in the RF communications network of Meier '436 in view of Shepard in view of Meier '619 in order to provide communications to remote terminals at greater distances without increasing base station range and in turn without increasing power consumption or collisions, and wherein guaranteed coverage for fringe areas is provided without adding additional wiring and furthermore wherein continuing coverage is provided when a wired base fails.

Regarding claim 19, as discussed above regarding claims 2 and 13, Meier '436 teaches a preferred embodiment wherein collocated nodes exchange scheduling information (e.g., HELLO packet) over the first interface during a time frame (e.g., two seconds, see col. 20, lines 7-8) such

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that data is also sent by the non-located nodes over the second interface during the time frame (e.g., see col. 20, lines 2-5 regarding five millisecond data packet segments).

Regarding claim 20, as discussed above regarding claims 10, 11 and 17, Meier '436 teaches a first interface comprising a wired link (e.g., hard-wired communication link, see col. 3, lines 12-13) and a second interface comprising a wireless link (e.g., RF links, see col. 3, line 15).

11. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier '436 in view of Shepard in view of Meier '619 in view of Meier '031, further in view of Aaronson.

Regarding claims 21 and 22, Meier '436 in view of Shepard in view of Meier '619 in view of Meier '031 teach the method of claim 18 as discussed above, however, may not specifically disclose having a first and second time frame for particular transmissions or exchanging second control information over the second interface.

As discussed above regarding claims 3, 4, 14 and 15, Aaronson teaches a communications protocol for wireless communications whereby time is broken up into frames, further divided into slots (e.g., see col. 4, lines 22-44). A control channel, comprising slots used for control information, as well as a data channel, comprising the remaining slots, are provided within each frame. Thus, Aaronson teaches improved means of wireless communications having a first and second time frame in the form of a control channel and a data channel, or control and data portions. Specifically, the teachings of Aaronson provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information (e.g., see col. 3, line 47 – col. 4, line 2). Aaronson also teaches wireless

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communications links such as those found in the second interface of Meier '436 (e.g., RF links) whereby both control information and data are transmitted. Thus, the teachings of Meier '436 in view of Shepard in view of Meier '619 in view of Meier '031 would clearly benefit from implementing the communications protocol of Aaronson. Such a combination would provide more reliable transmission between non-collocated and collocated nodes whereby both control information and data could be transmitted between nodes. Furthermore, as discussed above, the teachings of Aaronson provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to use the communications protocol of Aaronson with the system of Meier '436 in view of Shepard in view of Meier '619 in view of Meier '031 in order to, e.g., provide dramatic increases in the efficient use of spectrum within a region, route diversity, and load balancing for packet carried information.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9314 for regular communications and 703.872.9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott



August 20, 2003



HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600